

# Bluephase® PowerCure

## Bluephase G4

### Polyvision®

#### 1. What is Polyvision?

The patented Polyvision technology is the personal light-curing assistant that supports each individual user. The automated assistance system helps users achieve a reliable depth of cure and therefore meets the No. 1 requirement of customers! The curing light automatically detects movement of the handpiece during the light-curing process. If movement has occurred, the light emits a vibration alert to inform the operator of the error and automatically extends the exposure time by 10 per cent.

If the curing process may be put into jeopardy because of the movement, the light will automatically interrupt the exposure cycle. In addition, it will vibrate three times and emit an acoustic alert. The user can now repeat the curing procedure to achieve a reliable result.

Furthermore, Bluephase PowerCure and Bluephase G4 are equipped with active anti-glare protection and can therefore not be activated in open space. Only if the light is positioned over a light-reflecting area - such as a composite surface or tooth - does it switch on.

#### 2. Can the Polyvision function be switched on and off as desired?

Yes. The Polyvision function can be switched on and off by long pressing the program or time selection key for two seconds.

The Polyvision function is not activated ex-factory! Operators who are not aware of Polyvision could think that the light is defective because it does not switch on and yet the first thing they may want to do after unpacking the light is to activate it and try it out. To prevent any misconceptions, a note is added to the handpiece in the packaging, giving users instructions of how to activate Polyvision.

The display on the handpiece tells users whether or not Polyvision is activated. If the Polyvision function is activated, the Polyvision logo (two eyes) is lit up. If Polyvision is deactivated, the two eyes of the Polyvision logo cannot be seen.



#### 3. How does Polyvision work?

Two state-of-the-art sensors measure the amount of light reflected back to the light probe. At the beginning of the light-curing procedure, the unit emits light in a low intensity with the purpose to measure the amount of light that is reflected back. In this way, the unit establishes in milliseconds whether or not it is positioned above a reflective surface. If the unit is in open space or above an area that does not reflect a given amount of light (e.g. in the oral cavity), the light does not start the light-curing procedure. If the unit is positioned above a reflective surface, e.g. a composite substrate, tooth or a white sheet of paper, the sensors will register a sufficient amount of back reflection to allow the unit to start the light-curing process. This verification process happens so quickly that users do not even notice it.

If the curing light starts the curing process, the unit records the amount of back reflection it receives at the beginning of the exposure cycle. If the unit - after the curing process has started - is being moved away from the original position, the amount of light being reflected back may change. The sensors will register this change. If the deviation in light reflection exceeds 15 per cent, the unit starts to vibrate

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and extends the curing time by ten per cent. If the unit shifts so severely during the light-curing process that the deviation in reflection is approx. 50 per cent or more, the exposure cycle is automatically interrupted to allow the operator to repeat the light-curing process.

#### 4. How important is the initial position of the curing light?

It is very important that the operator positions the curing light correctly at the beginning of the curing process. We recommend observing the general guidelines for safe light curing (wear protective goggles, watch with a wakeful eye, secure the light probe with your index finger and thumb). Bluephase PowerCure & Bluephase G4 will start the curing process as soon as the sensors register a sufficient amount of back reflection. The curing process is also started even if the light is positioned on the wrong tooth or positioned only in part over the material to be cured. If the light is then moved to align it fully with the material to be cured, it may emit an alert to warn the operator of the error. For this reason, it is important that operators determine the correct point when and where they want to start the curing process so that the Polyvision function can assist them in the most appropriate and helpful way.

#### 5. Does Polyvision also work on teeth that are not completely white?

Like all previous Bluephase features, Polyvision has been designed with everyday use in the dental practice in mind. The system is designed and validated to assist dental professionals in the best possible way. The curing light is therefore also effective even if the tooth is not completely white. Stained teeth, as can be seen in most patients, produce enough back reflection for the sensors to trigger the curing process.

#### 6. What are the limitations of Polyvision?

Polyvision is a fully matured system. Like any system, however, it has a few limitations, such as:

**Protective sleeve:** Protective sleeves feature a certain amount of intrinsic reflection. If the curing unit is clothed in a protective sleeve, the light sensor will measure a certain amount of back reflection. Therefore, the curing process always starts if a protective sleeve covers the curing unit and active anti-glare protection does not take effect. The back reflection measured by the sensors includes the back reflection of the protective sleeve and will be recorded as the baseline value. If the amount of back reflection changes due to movement of the curing light, the sensors register the deviation from the baseline value during the curing process and the device starts to vibrate and/or switches off. The protective sleeve does not affect this feature.

**Incisors:** Incisors reflect less light back than the other teeth due to their size. The sensors may not measure a sufficient amount of back reflection to trigger the light-curing process if incisal areas are cured. This situation can be overcome by deactivating the Polyvision feature. The curing process is then carried out without the personal light-curing assistant.

**Class I adhesive curing:** At times, Class I cases may involve very deep cavities. In addition, a matrix band is often placed in such restorations. In cases like this the distance between the curing light and the adhesive can often be quite wide when the adhesive is being light cured. In some cases, the distance is so wide that the sensors do not receive enough back reflection to start the curing process. If

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this is the case, the Polyvision should be deactivated. The curing process is then carried out without the personal light-curing assistant.

Occlusal slipping in Class I restorations: If a Class I cavity is illuminated from the occlusal aspect, the difference in size between the adjacent teeth is only minimal. This means that the back reflection of adjacent teeth is similar to that of the tooth being illuminated. If the curing light now slips out of position onto the adjacent tooth, the curing light detects a sufficiently high change in the amount of back reflection to vibrate. However, it does not interrupt the curing process. Users should always bear this in mind.

### Efficient esthetics

#### 7. What is meant by 'Efficient Esthetics'?

Ivoclar Vivadent empowers dental professionals to create high-quality esthetic restorations efficiently and effectively using a range of coordinated materials for direct restorative procedures.

#### 8. What part do Bluephase PowerCure & Bluephase G4 play in this?

##### Esthetics:

Esthetic restorations: mission impossible without reliable curing results

##### Quality:

Reliable curing results thanks to the personal and intelligent Polyvision light-curing assistant  
 Reliable curing results in both direct and indirect procedures  
 Reliable curing results for all light-curing dental materials due to Polywave® LED technology  
 Reliable curing results thanks to homogeneous light distribution

##### Efficiency:

Short curing times starting from 3 seconds\*

The wide 9-mm light probe allows time-saving single-shot curing procedures.\*\*

Additional PreCure program especially designed to facilitate the removal of excess luting material

\* only possible with the Bluephase PowerCure in conjunction with the 3s PowerCure product system. \*\* Bluephase G4: 10 mm

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### Indications

#### 9. Which dental materials can be light cured with Bluephase PowerCure & Bluephase G4?

Both devices come with integrated polywave LED technology to cover a wide wavelength range. Both devices are therefore suitable for any dental material that polymerizes in a wavelength range between 385 to 515 nm. These materials include restoratives, bonding agents/adhesives, bases, liners, fissure sealants, temporaries as well as luting materials for brackets and indirect restorations (e.g. ceramic inlays).

#### 10. For how many seconds do you have to light cure?

Basically, the curing times indicated in the instructions for use of the material being used should be adhered to. In addition, the operating manual of the relevant curing light offers an overview of the curing times required for the materials from Ivoclar Vivadent AG.

### 3s PowerCure product system

#### 11. What is the 3s PowerCure product system?

3s PowerCure offers a fully coordinated range of products for long-lasting composite restorations of Class I and II in the permanent posterior dentition. 3s PowerCure is an open product system from the "Direct Restoratives" category for the restoration of posterior cavities using restorative dental composites.

#### 12. Which products are part of the system?

- Adhese Universal
- Tetric PowerFlow
- Tetric PowerFill
- Bluephase PowerCure

#### 13. What is an open product system?

An open product system means that each individual product can also be used on its own and - if the relevant instructions for use are observed - in combination with other adhesives, composites and curing lights following a conventional procedure with longer curing times.

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### 14. Is it possible to use other high-intensity curing lights to cure the materials in 3-second exposure shots?

A light intensity of 3,000 mW/cm<sup>2</sup> is required to achieve a 3-second cure in conjunction with the products from the 3s PowerCure range. If a curing light achieves this intensity, a 3-second cure is possible.

Note: The light intensity of commercial curing lights often does not match the light intensity claimed. We therefore recommend operators to check the light intensity emitted by their curing devices with the help of the Bluephase Meter II radiometer to make sure that the curing light achieves an adequate light intensity. In addition, high-intensity curing lights should only be used if the manufacturer of the device has gained evidence from relevant clinical studies to confirm that no critical heat build-up occurs.

### 15. Is the Valo\* (Ultradent) curing light suitable for the 3-second curing of the 3s PowerCure composites?

The manufacturer claims that Valo\* provides a light intensity of 3,200 mW/cm<sup>2</sup> when used in the “Xtra Power” program. Measurements carried out by the R&D department at Ivoclar Vivadent with two different Valo\* devices revealed that neither of them achieved a sufficiently high light intensity to cure the materials of the 3s PowerCure system in 3 seconds. The curing light does not provide the light intensity claimed by the manufacturer and is therefore not suitable for the 3-second cure.

### 16. Is the 3-second light-curing program of the Bluephase PowerCure also suitable for other materials (e.g. Variolink® Esthetic) or other indications (orthodontics, anterior restorations etc)?

No. The 3-second curing time of the Bluephase PowerCure is strictly limited for use in conjunction with the materials of the 3s PowerCure product system for the restoration of Class I and II cavities in permanent posterior teeth.

\*not a registered trademark of Ivoclar Vivadent AG

## Safety notes

### 17. Why is the blue light emitted in the visible range perceived as heat?

In contrast to the heat which is generated within the housing as a side effect of the light source, this occurrence relates exclusively to the output of blue light at the light emission window. The chemical process of polymerization requires the supply of high energy. In the case of light-induced polymerization, this happens by illuminating the corresponding material with very energy-rich blue light in the visible wavelength range of 385 to 515 nm. A light intensity of 400 mW/cm<sup>2</sup> is regarded as the minimum light output to polymerize direct restorations. With shorter curing times, however, considerably higher light output levels are needed. Hence, today's high-performance curing lights emit light intensities of 1,000 mW/cm<sup>2</sup> and higher.

The blue light emitted by the curing lights is outside, or rather below, the range of infrared radiation (> 770 nm) and represents energy rather than temperature. Should the blue light inadvertently hit soft tissue, however, this energy is converted to heat. The following principle applies: the higher the light

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intensity, the shorter are the required curing times and the higher is the energy emitted and/or the heat perceived. This physical principle applies to every curing light, irrespective of the light source incorporated into it (i.e. halogen, laser, plasma or LED). Consequently, the differences between the individual curing lights can basically be attributed to the differences in light intensities.

While composites are undergoing polymerization, heat is produced as a result of the irradiation energy and the exothermal reaction. With regard to the pulp, it is generally assumed that a maximum temperature increase of 5.5 °C is clinically acceptable. Current findings and study results show that the Bluephase curing lights meet this criterion and can consequently be regarded as safe for clinical use.

Users are advised to observe the information regarding the programs and curing times given in the instructions for use. Moreover, careful positioning of the light guide so that it accurately points towards the material to be cured is essential to protect the soft tissues. If necessary, the treatment can be carried out using external cooling with an air syringe and a corresponding extension of the curing times.

### 18. Does the use of the Bluephase PowerCure lead to inappropriately high heat?

External studies (e.g. Dr Cesar Arrais, State University of Ponta Grossa, Paraná, Brazil (2018/2019); data available upon request) showed that the heat development is approx. 2.5 °C if the 3s curing mode of the Bluephase PowerCure is used. The heat development in connection with the High Power mode tends to be in a similar range. This means that the heat development is clearly below the scientifically acceptable range of 5.5 °C.

### 19. What must be considered for the treatment of patients with a cardiac or cerebral pacemaker?

All curing lights devices of the Bluephase line are suitable for use on patients with a brain or heart pacemaker. Investigations have shown that there is no (electromagnetic) incompatibility between the curing lights and pacemakers.

### 20. What about the simultaneous use of mobile phones?

Portable and mobile high-frequency communication devices may interfere with other electronic devices. Therefore, the use of mobile phones during operation of the Bluephase curing lights is not allowed.

## Hardware

### 21. What are the technical differences between the Bluephase G4 and the Bluephase PowerCure?

**Bluephase G4** is a curing light of the 4th LED generation. It incorporates the proprietary Polyvision technology that serves as a personal light-curing assistant for the operator, enabling the device to detect movement of the light guide during the curing process and thereby assist the operator in obtaining reliable curing results. In addition, the curing light is equipped with the polywave LED technology - also a proprietary development - which offers a broad emission spectrum and a light intensity of 1,200

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mW/cm<sup>2</sup>. The device is therefore suitable for light-curing all known dental materials and photoinitiators quickly and reliably.

**Bluephase PowerCure** additionally offers short curing times of 3 seconds in conjunction with the 3s PowerCure product system if the 3s curing program emitting a maximum light intensity of 3,000 mW/cm<sup>2</sup> is used. Moreover, certain composites can be light-cured in 5 seconds if the Turbo program with a light intensity of 2,000 mW/cm<sup>2</sup> is utilized. Given the high performance of the Turbo program, the light is also exceptionally suitable for polymerizing indirect restorations.

### 22. Why do the Bluephase PowerCure/Bluephase G4 lights come without a fan? And why is it possible to use the lights in continuous operation of ≥ 10 minutes at normal ambient temperatures of approx. 22 °C even without a fan?

Basically, it is not the component "fan" that provides the advantage, but the corresponding protection from overheating. A fan was required in older polymerization devices to provide effective cooling of the LED and electronic components. The Bluephase PowerCure and Bluephase G4 are equipped with especially energy-efficient LEDs. This means that they produce the same light output with less heat, compared with other LEDs. Furthermore, most components of the handpiece are made of aluminium. Aluminium distributes heat very well and also reflects heat over a large area. This means that these curing lights dissipate more heat than other devices and are therefore able to offer long operating times. The temperature sensors in the curing light additionally protect the LEDs and the electronic components from overheating.

### 23. Why can it happen that the handpiece becomes warm sometimes?

The LED has a specific degree of efficiency, i.e. part of the energy used is converted to light and part of it is converted to waste heat. This waste heat causes the handpiece to become warm. Ivoclar Vivadent AG takes the safety of users and patients very seriously, which is why only a certain degree of warming is acceptable (<48 °C / <118°F). The Bluephase PowerCure and Bluephase G4 lights are equipped with overheating protection, which continuously monitors the temperature of the curing light and automatically switches off the device if a certain threshold is exceeded. Once the device is cooled down, it can be operated again. The automatic temperature-induced shut-down protects users and patients from harm.

### 24. What does the imprint "INT 3Min/7Min" on the bottom side of the handpiece mean?

This imprint presents an additional safety measure in case the automatic shut-down mechanism is defective. Should the shut-down not be working, the device displays an error alert. In such circumstances, the unit should be operated for no more than 3 minutes in continuous operation when used in maximum ambient temperatures of up to 35 °C in the dental practice. If the device is used in continuous operation for 3 minutes at an ambient temperature of 35 °C, it should subsequently be allowed to cool for 7 minutes. However, it is extremely rare that these three conditions - ambient temperatures of 35 °C in the dental practice, continuous operation and failure of the shut-down mechanism - all occur at the same time.

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### 25. How do you dispose of the curing light and its battery?

Curing lights and unserviceable batteries should be disposed of according to the corresponding legal requirements in the country where they are used. You can obtain further information from your dental dealer, your local Ivoclar Vivadent Service Centres and local disposal contractors.

### 26. How does inductive charging work?

The charging base generates a pulsing magnetic field in the black recess. This field then transfers the energy into the battery where the magnetic field is received and converted to electric energy, without physical contact. The magnetic field is also used for the communication between the battery and the charging base. It enables the charging base to check whether or not a battery is inserted. Energy is only transmitted if a battery is inserted into the charging base of the Bluephase PowerCure or Bluephase G4. If the charging base is not connected to a battery, or if the charging base is connected to a different object, no energy transmission takes place. Once the battery is fully charged, the battery communicates this to the charging base, which then ends the energy transmission. The magnetic field generated by the charging base is entirely non-hazardous for people or other electronic devices and does not lead to any increase in temperature or other damage.

## Technologies

### 27. What does the term “polywave” mean?



The term "polywave" and the pictogram consisting of a blue wave and white sphere provide this patented LED technology with a defined name and a descriptive icon. "Poly" stands for both "polymerization" and "more" (Greek) and "wave" is self-explanatory in English.

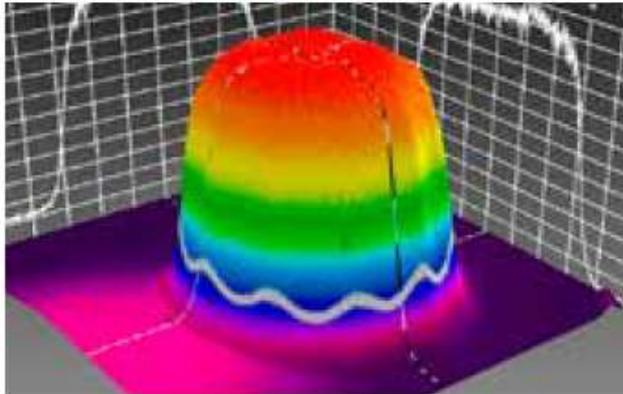
The blue wave symbolizes the blue light, or the light in a specific wavelength range, required to polymerize dental materials. The highs and lows of the wave ("peaks & valleys") represent the two different types of diodes, which generate light in two different blue light ranges (blue and violet). The white sphere epitomizes the light initiators (molecules) that trigger the polymerization process. The shape of the sphere represents perfection, or completeness, and denotes the universal suitability of the Bluephase curing lights for all initiators and light-curing materials - including whitish initiators such as acyl phosphine oxide. The distance between the sphere (material) and the blue wave (curing light) denotes the typical clinical situation whereby e.g. composites are illuminated whilst the light probe is held at a certain distance from them and they receive nonetheless an adequate amount of light to cure appropriately.

### 28. How homogeneous is the light emitted by the Bluephase PowerCure and Bluephase G4?

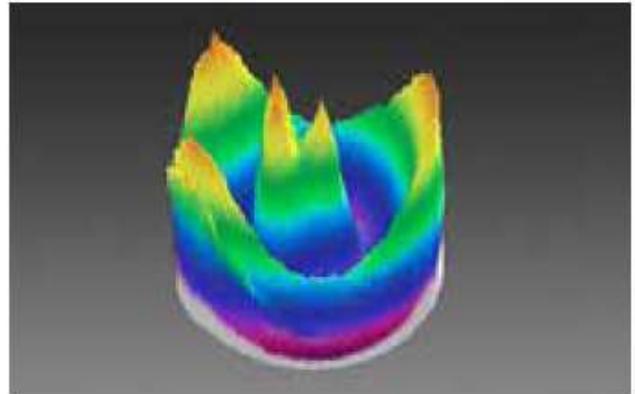
In addition to the light output and wavelength range, the distribution of the light emitted from the curing light is critical for a reliable polymerization process. If the light is not evenly distributed across the entire surface to be polymerized, the material may not achieve a complete depth of cure in some areas. Bluephase PowerCure and Bluephase G4 are equipped with reflector technology that ensures a virtually homogeneous distribution of light.

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Homogene Lichtverteilung bei Bluephase PowerCure



Beispiel einer heterogenen Lichtverteilung

[Captions: Homogeneous light distribution provided by the Bluephase PowerCure  
Heterogeneous light distribution]

### Accessories

#### 29. Which light guides can be used?

By default, the Bluephase G4 comes with a black, shortened 10-mm light guide (691 265), covering a multitude of indications. Bluephase PowerCure is supplied with a tapered 10>9 mm light guide that is also shortened at the tip (668 873). As an additional accessory, a 6>2 mm pin-point light guide (691 264) is available for the selective cementation of indirect restorations and for the removal of excess material.

#### 30. How can you distinguish between the light guide of the Bluephase PowerCure and the Bluephase G4?

While the 10-mm light guide (691 265) of the Bluephase G4 has nothing written on it, the tapered light guide (668 873) of the Bluephase PowerCure is imprinted with "10>9".

#### 31. What happens if the light guides of different Bluephase curing lights are interchanged with each other?

Interchanging the light guides has a direct effect on the light intensity emitted by the curing light. As part of the manufacturing process, the light guide and the associated handpiece are calibrated to emit the desired light intensity. The light intensity may be increased or reduced if the light guides are swapped with each other after the calibration process in the factory.

Under no circumstances should a curing light be fitted with the light probe of another curing light. For instance, the light intensity increases significantly if a tapered 10>9 mm light guide is attached to a Bluephase G4 that originally has been calibrated for a 10-mm light guide. The reason for this is that the taper of the diameter from 10 to 9 millimetre focuses the light into a smaller emission surface area, resulting in an increase in the energy being emitted. The same principle applies to the light intensity of the Bluephase PowerCure, albeit in reverse: if the 10-mm light probe of the Bluephase G4 is attached to it, its light intensity decreases.

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Care should be taken to ensure that only the light guide included in the delivery range is used for the corresponding handpiece.

### 32. Can you check the light intensity of the Bluephase curing light after having purchased it?

The curing light is calibrated to emit a certain intensity in the factory. We recommend using the Bluephase Meter II (667 124) dental radiometer to check the light intensity on a regular basis in the office. The radiometer is available as an accessory.

In addition, the charging base of the Bluephase Power Cure and the Bluephase G4 come with a built-in radiometer, which can also be used to check the light intensity on a regular basis. The radiometer built into the charging base is designed to regularly check the light intensity of the curing light and is therefore calibrated to that particular curing light. The radiometer of the charging base is not designed to measure the light intensity of other curing lights (even if the diameter of the light guides are the same).

### 33. Why does the Bluephase Meter II sometimes show a value in the lower tolerance range when it is used to examine a Bluephase light of the 4th generation?

The light intensities of all Bluephase curing lights are calibrated to the correct value with the help of an Ulbricht sphere. The Bluephase curing lights of the 4th generation use the innovative “Puravis” glass optical fibres, which include a variety of advantages, such as increased fracture strength. In addition, the light distribution homogeneity has been further improved to a near-perfect degree due to new homogenizing technology.

In the past, the Bluephase Meter II radiometer used to be calibrated to conventional glass fibre rods. These rods are used in all the other Bluephase curing lights, have slightly different scattering characteristics than the Puravis fibres. When checking the light intensity of 4<sup>th</sup>-generation Bluephase lights, a slight deviation of up to -5% may occur within the standard tolerance range of  $\pm 10\%$  compared with the values measured with an Ulbrecht sphere, as the measuring sensor cannot record this difference correctly. New optimized radiometers that offset this deviation will be available as of April 2019.

The light guide should be positioned flat/plane and parallel to the surface of the sensor to enable the Bluephase Meter II to include all the incident light in the reading. The light guide is positioned correctly if hardly any light is reflected outside the area of the emission window and the user does not become dazzled by the light emitted. A finger can be used to keep the light in an appropriate position.



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### 34. Are the anti-glare shield and the anti-glare cone autoclavable?

Yes, the anti-glare shield (691 255) and the anti-glare cone (551 756) can be sterilized in an autoclave.

### 35. Is it possible to autoclave the handpiece support?

No, the handpiece support (691 262) is not autoclavable.

### Additional products

### 36. Total Energy Concept and Tetric EvoCeram Bulk Fill and Tetric PowerFlow – How does this all hang together?

The Total Energy Concept\* states that a certain amount of energy is required for achieving a complete cure in a composite restoration. The amount depends on the type, shade and translucency of the composite being used. Generally, a maximum dose of 16,000 mWs/cm<sup>2</sup> is required for the adequate polymerization of 2 mm thick increments, and possibly less. The curing times are calculated on the assumption that this maximum dose should be administered and that the light guide is placed directly above the composite. Hence, curing times vary depending on the light intensity emitted by the curing light.

#### Total Energy Concept

Required energy dose ÷ light intensity = resulting curing time

Example Bluephase G4:

16,000 mWs/cm<sup>2</sup> ÷ 1,200 mW/cm<sup>2</sup> ~ 15 seconds (exact: 13.3s)

**The IV product portfolio:** An energy dose of 10,000 mWs/cm<sup>2</sup> is sufficient for the complete curing of Tetric, Tetric EvoCeram and IPS Empress Direct and an energy dose of 15,000 mWs/cm<sup>2</sup> is required for Heliomolar. Tetric PowerFill and Tetric PowerFlow incorporate the unique and patented light initiator Ivocerin. This means that even 4-mm thick increments can be light cured with an energy dose of only 9,000 mWs/cm<sup>2</sup>. As a result, exceptionally short curing times of only 3 seconds (using the 3s PowerCure product system) are possible.

\* Koran P, Kürschner R: Effect of sequential versus continuous irradiation of a light-cured resin composite on shrinkage, viscosity, adhesion, and degree of polymerisation. Am J Dent 1998;10:17–22.

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### 37. Is the depth of cure affected by the different levels of translucency of IPS e.max?

It can be assumed that the different levels of translucency have an effect on the penetration of light emitted by the Bluephase curing lights. The more opaque shades, such as HO 2, HO 0 and LT C4 are considered less conducive to light penetration.

Light and dual-curing composites are used for the adhesive cementation of indirect restorative materials. Particularly for all-ceramic restorations based on glass-ceramic materials, such as IPS Empress, adhesive cementation with composite luting materials is recommended. Given the opacity of these materials, however, the quantity of light that actually reaches the composite is substantially reduced. For this reason, most luting composites contain additional initiators to enable a self-curing process. For reasons of esthetics, the self-curing catalyst is often omitted in the case of translucent materials or materials for the visible esthetic zone because self-curing components tend to contain amines, which are not stable to light in the long run. Therefore, purely light-curing cementation systems, such as Variolink Esthetic LC, are preferred for anterior restorations (e.g. ceramic veneers). This begs the question, however, whether or not enough light is transmitted through the crown or the inlay to ensure thorough polymerization of the composite if only a photosensitive initiator is used.

Dr Ilie, who works with Prof. Hickel at the LMU Munich, analyzed the effect of various types of ceramic materials, layer thicknesses and translucencies on the curing depth of the purely light-curing composite Variolink II Base:

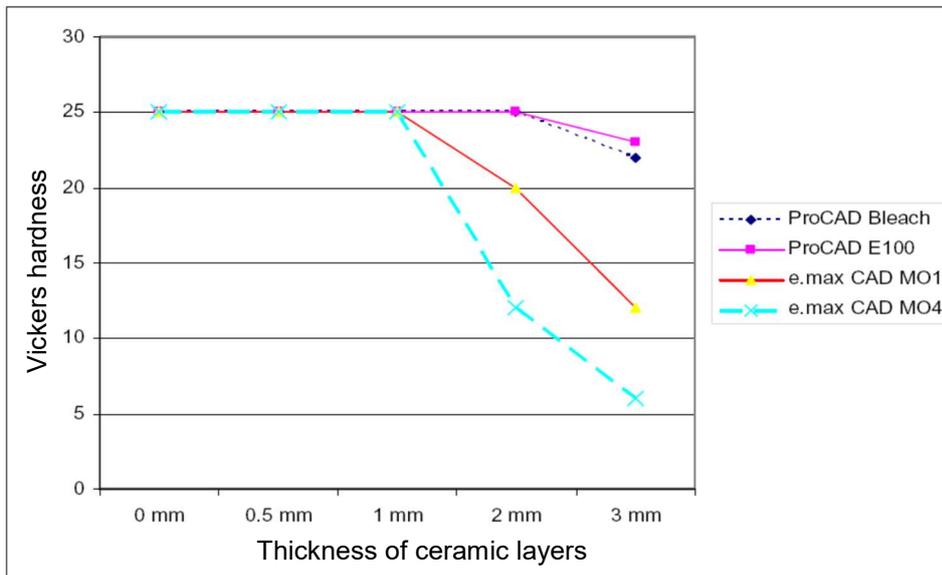


Fig.: Vickers hardness of Variolink II Base after curing through ceramic layers of various thicknesses (ProCAD and IPS e.max CAD) (Ilie, Munich, 2007)

ProCAD is a relatively translucent leucite ceramic (comparable with IPS Empress CAD), IPS e.max MO is a rather opaque lithium disilicate framework ceramic. With the translucent ceramic, the composite can be adequately cured up to a ceramic layer thickness of 3 mm, while a decrease in hardness is recorded already at a thickness of 2 mm in conjunction with the more opaque ceramic. It is advisable to use a dual-curing luting composite in such cases.

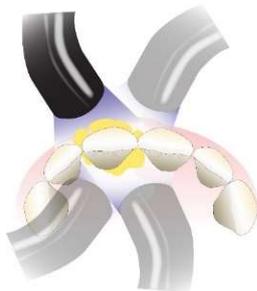
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### 38. How do you remove excess cement when you use a curing light of the 4th generation?

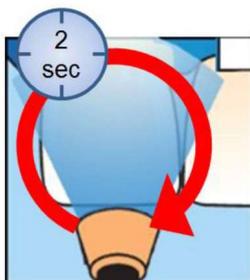
Cleaning up excess light-cured adhesive composite can be difficult and unpredictable. The PreCure mode of the Bluephase PowerCure and Bluephase G4 is pre-set to a light output of 950 mW/cm<sup>2</sup> and an exposure time of 2 seconds and is therefore especially designed for pre-curing Variolink Esthetic. Excess material is cured to a consistency that is neither too hard nor too soft but just right for a high-quality pleasant clean-up procedure using a scaler. Once the excess has been removed, Variolink Esthetic is light-cured again so that it achieves its final depth of cure. Depending on the type of restoration and the version of Variolink Esthetic being used, a choice of two different methods for the initial light-induced activation of excess cement is available: the “quarter technique” and the “circular technique”. The two techniques are described as follows:

#### "Quarter technique" for Variolink Esthetic DC



If the quarter technique is used, excess cement is removed by irradiating each quarter surface (mesio-oral, disto-oral, mesio-buccal, disto-buccal) for 2 seconds from a distance of no more than 10 mm. Subsequently, excess material is simply peeled off with a scaler. It is important to remove excess from difficult-to-reach areas (proximal space, gingival margin, pontic) promptly.

#### "Circular technique" for Variolink Esthetic LC (Veneers / Inlays / Onlays)



If the circular technique is used, excess cement is removed by running the light guide along the cement joint at a distance of 10 to 15 mm for a length of 2 seconds using the PreCure program. If the restoration is a veneer, the starting and finishing point should be on the incisal aspect and the cement joint should be irradiated with the curing light in a circular clockwise motion. If the restoration is an inlay/onlay, the starting and finishing point should be on the mesial or distal aspect and the cement joint should be irradiated in a circular motion. Subsequently, any excess material can be simply peeled off using a scaler. It is important to remove excess from difficult-to-reach areas (proximal space, gingival margin) within good time.

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### Portfolio and delivery forms

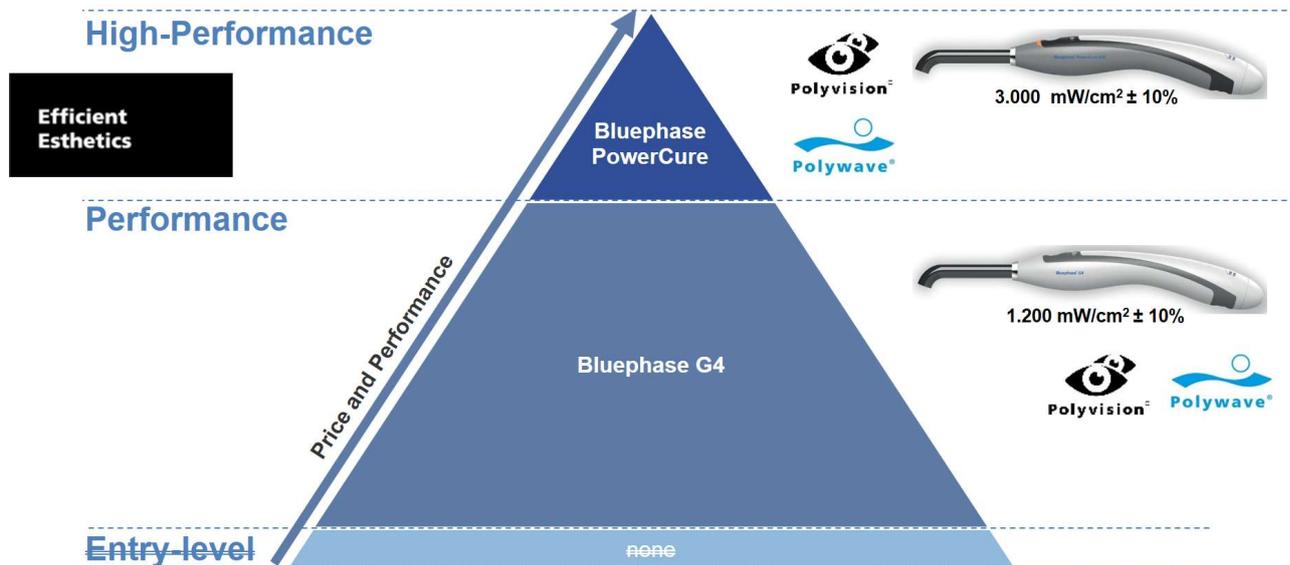
#### 39. Which delivery forms are comprised in the new portfolio?

The new portfolio consists of 2 different curing lights and 3 different delivery forms.

The high-performance Bluephase PowerCure is available in a delivery form that includes an integrated radiometer and Click&Cure functionality (667092).

The Bluephase G4 is also available with an integrated radiometer and Click&Cure functionality (691257). In addition, this curing light is available in a delivery form that only includes a conventional charging base, without integrated radiometer and Click&Cure functionality (691258).

### A-Portfolio



#### 40. Can you also purchase system kits that include a range of restorative materials?

Yes, both the Bluephase PowerCure System Kit, assorted (691918) and the Bluephase PowerCure System Kit, syringe (668253) comprise the Bluephase PowerCure curing light and all the materials of the 3s PowerCure product system (composites and adhesive). The price of these kits is the same as the price for the Bluephase PowerCure curing light alone. These kits are designed to introduce dentists to the 3s PowerCure product system.

#### 41. Which accessories can be ordered as spare parts?

In addition to the light guides (see Question 29), the handpieces, batteries, protective sleeves, anti-glare cones, anti-glare shields, the Bluephase Meter II and the handpiece support are available as spare parts. Further information is provided in the Delivery Forms document.